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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/723,075

11/25/2003

Rangachary Mukundan

S-102,315

8636

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04/16/2008

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EXAMINER

OLSEN, KAJ K

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

04/16/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/723,075	Applicant(s) MUKUNDAN ET AL.	
	Examiner KAJ K. OLSEN	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. In view of the appeal brief filed on 1-15-2008, PROSECUTION IS HEREBY REOPENED. The new grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Nam X Nguyen/

Supervisory Patent Examiner, Art Unit 1753.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller et al (USP 4,277,323) in view of Volkov et al (CAS abstract for SU patent 1247740 7-1986). Volkov is being cited and relied on for the first time with this office action.

3. Muller discloses a sensor comprising an electrolyte body 32 having a first electrolyte surface (i.e. the upper surface) with a reference electrode 30 depending therefrom, and another electrode body 31 having a first electrode surface coplanar with the first electrolyte surface. See fig. 2; col. 1, l. 64 - col. 2, l. 3; and col. 4, ll. 16-23. Muller does not explicitly disclose the use of a metal oxide for the electrode body but they did stress an embodiment where one of the two electrodes (30, 31) is made of a non-catalytic material (col. 5, ll. 7-13). Volkov teaches in an alternate oxygen sensor that materials such as $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ find utility as non-catalytic electrodes. See the abstract. Because Muller stressed that one of its electrodes should be made non-catalytic and Volkov demonstrated that metal oxides already find utility in the art as non-catalytic electrodes for oxygen sensors, it would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Volkov for the sensor of

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Muller to yield the predictable result of having an oxygen sensor with the desired non-catalytic electrode. With respect to the sensor being a hydrocarbon sensor, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. With respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself.

Because the product of the claim is identical to the invention of Muller and Volkov the process from which it was made is the same as or obvious over the process utilized by Muller and Volkov (see *In re Thorpe*, 777 F.2d 695, 698).

4. With respect to the particular choice of $x=0.2$ for the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ above, Volkov does not appear to stress any criticality to the choice of $x=0.3$ for its electrode composition. One possessing ordinary skill in the art would have been motivated to consider other compositions in the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ system, including the use of $x=0.2$, because varying the composition to get the preferred sensor performance requires only routine skill in the art.

5. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jakobs et al (Ionics, 2, 1996, pp. 451-458) in view of Muller. Jakobs is being cited and relied on for the first time with this office action.

6. Jakobs discloses a hydrocarbon sensor comprising an electrode body having a first electrolyte surface (upper surface of fig. 3) with a Pt electrode depending therefrom. This platinum electrode reads on the defined “reference electrode” giving the claim terminology its broadest reasonable interpretation. Jakobs further discloses a metal oxide electrode body (perovskite powder electrode) on the electrolyte body. See section 2.2 on p. 453 and fig. 3 on p. 454. Jakobs does not explicitly disclose that the metal oxide electrode body is contained within

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the electrolyte body. Muller teaches that embedding the electrodes within the electrolyte body has the advantage of providing a gas sensor that has a low heat capacity and can be brought up to operating temperature more rapidly. See col. 1, l. 64 - col. 2, l. 28. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Muller and embed the metal oxide and reference electrodes into the electrolyte for the hydrocarbon sensor of Jakobs in order to arrive at a sensor that can be brought up to operating temperature more rapidly. With respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself. Because the product of the claim is identical to the invention of Jakobs and Muller the process from which it was made is the same as or obvious over the process utilized by Jakobs and Muller (see *In re Thorpe*, 777 F.2d 695, 698).

7. With respect to the particular choice of $x=0.2$ for the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ above, Jakobs does not appear to stress any criticality to the choice of $x=0.1$ for its electrode composition. One possessing ordinary skill in the art would have been motivated to consider other compositions in the $\text{La}_{1-x}\text{Sr}_x\text{CrO}_3$ system, including the use of $x=0.2$, because varying the composition to get the preferred sensor performance requires only routine skill in the art.

8. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Volkov or Jakobs in view of Muller as applied to claim 1 above, and further in view of Mase et al (US 4,755,274).

9. With respect to claim 4, Jakobs and Muller disclosed all the limitations and further specified the use of yttria stabilized zirconia (see Jakobs, section 3, p. 454). Jakobs and Muller did not explicitly suggest the use of zirconia having the specified porosity. Muller and Volkov

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disclosed all the limitations and further specified the use of stabilized zirconia (see Muller, col. 3, ll. 65-67). Muller and Volkov did not explicitly suggest the use of yttria stabilized zirconia having the specified porosity. Mase teaches a sensor comprising a yttria stabilized zirconia electrolyte body (108) (col. 9, ll. 53-56) with a desired porosity for gas diffusion and measurement produced by sintering (column 13, lines 6 - 13). It would have been obvious to one of ordinary skill in the art to stabilize the zirconia electrolyte body of Muller with yttria as taught by Mase and to produce a desired porosity of the electrolyte body of Muller and Volkov or Jakobs and Muller by sintering as taught by Mase because as Mase explains the porosity of the electrolyte body is selected according to the required level of diffusion resistance and is a parameter to be optimized (column 13, lines 1 -6).

Response to Arguments

10. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAJ K. OLSEN whose telephone number is (571)272-1344. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795
April 16, 2008